

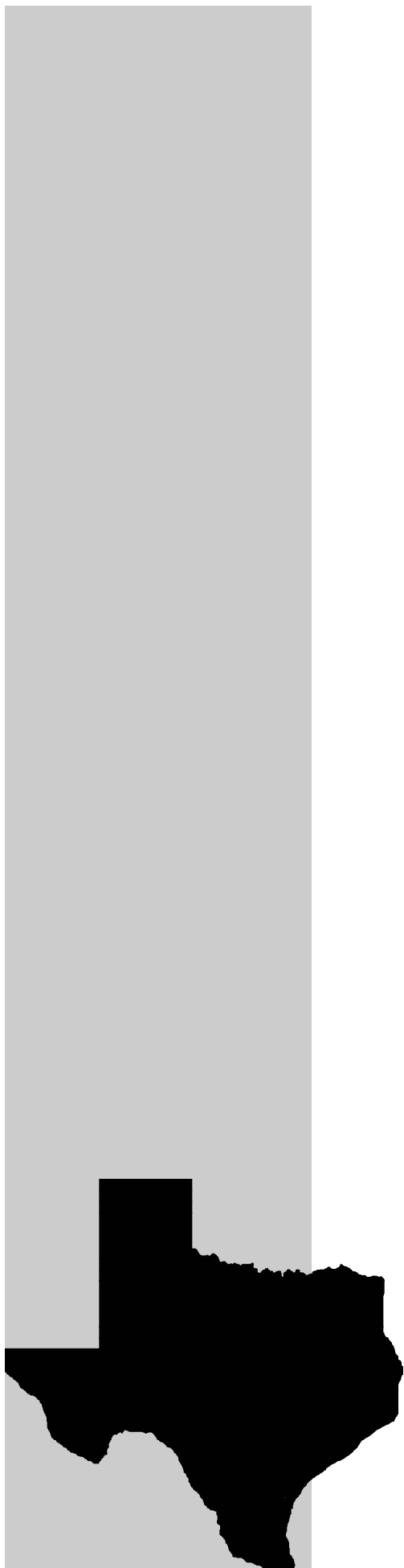
LONG-RANGE PLAN FOR TECHNOLOGY 1996-2010

A Report to the
75th Texas Legislature
from the
State Board of Education

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LONG-RANGE PLAN FOR TECHNOLOGY, 1996-2010

Texas Task Force on Educational Technologies

Appointed by Commissioner of Education Mike Moses

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SCHEDULE OF MEETINGS

September 13 - 14, 1995	Task Force Meeting
October 13, 1995	State Board of Education Meeting
December 30 - January 1, 1996	Task Force Meeting
January 12, 1996	State Board of Education Meeting
January 25-26, 1996	Task Force Meeting
February 16, 1996	State Board of Education Meeting
February 20-21, 1996	Task Force Meeting
March 19, 1996	Steering Committee Meeting
April 12, 1996	State Board of Education Meeting
April 18, 1996	Steering Committee Meeting
May 3, 1996	Steering Committee Meeting
May 10, 1996	Steering Committee Meeting
May 17, 1996	State Board of Education Meeting
May 21, 1996	Task Force Meeting
May 30, 1996	Steering Committee Meeting
July 17, 1996	Steering Committee Meeting
August 21, 1996	Task Force Meeting
August 27, 1996	Steering Committee Meeting
August 29, 1996	Steering Committee Meeting
September 9, 1996	Steering Committee Meeting
October 10, 1996	State Board of Education Meeting
October 14, 1996	Steering Committee Meeting
November 8, 1996	State Board of Education Meeting

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VISION OF TECHNOLOGY IN EDUCATION, 2010

“We don’t buy glasses; we buy vision. We don’t buy awnings; we buy shade. We don’t buy a newspaper; we buy information. It isn’t the product we want. It’s what the product will do for us. We buy something or pursue something, not because we want the thing itself, but because we want what that thing will give us or do for us.”

Max Anders in *The Good Life: Living With Meaning in A “Never Enough World”*

Imagine a home...

...where every parent — regardless of native language or socioeconomic background — can communicate readily with teachers about children’s progress, improve parenting skills, and get a degree or job training without leaving home or work.

Imagine a school...

...where every student — regardless of zip code, economic level, age, race or ethnicity, or ability or disability — can be immersed in the sights, sounds, and languages of other countries; visit museums; research knowledge webs from the holdings of dispersed libraries; and explore the inner workings of cells from inside the cell or the cold distance of outer space from inside a virtual* spacesuit.

Imagine a district...

...where every educator — regardless of subject, experience, or district location, size or wealth — can get hands-on training instantaneously, when or where he or she needs it; interact with a virtual community of professional colleagues; and have access to financial data and student performance information as well as the analytical tools to use them effectively.

Imagine a state...

...where every community member can visit the doctor for an examination and needed laboratory tests while at home or the office; collaborate with work colleagues at distant sites about complex data sets or video graphics; search primary source materials on an event half-way around the world; and take a high school or college course with fellow students from Port Arthur to El Paso by communicating rather than commuting.

*Virtual relationships or items are based on interactions or objects or representations that are in digital rather than in physical form.

What needs to happen for these images to become a reality?

- A technology infrastructure connecting schools, colleges, medical facilities, libraries, businesses, and homes must be established.
- Successful partnerships must exist among industries, the educational system, and other public service providers so that the new technologies and their applications are available and appropriate for education — and not only for the business and entertainment markets.
- The educational system must consider extending of the traditional boundaries of the school year, scholastic age, and geographic location.
- The teaching and learning process must be receptive to a wide variety of options, including expansion of learning into the home and into the broader community, development of virtual relationships among learners, and learning through distributed synthetic environments as well as on site.
- Educators must learn to access and incorporate a wide variety of resources for instructional support, research, and administration.
- Students of all ages and backgrounds must be active in the pursuit of resources to build individual and collaborative knowledge communities.

If the images become reality, who will benefit and what will the benefits be?

Students can expect higher performance and deeper engagement in academic endeavors by accessing resources available through a variety of modalities appropriate to individual learning styles.

Parents can expect not only to participate more directly in their children's education but also to improve their own knowledge as parents and citizens.

Teachers can expect to employ a wider variety of instructional approaches by having access to professional resources and by determining when and how to receive support, staff development, and classroom information.

Administrators can expect to be more fully informed and to manage more efficiently through timely access to and analysis of information, and to assist in direct operations of schools and administrative decision-making.

Taxpayers and school board members can expect more efficient use of resources, both financial and human, and more equitable allocation of each.

Community members can be afforded the opportunity to participate in key educational and community decisions and to participate in the educational process.

Communities can maintain their integrity because of the ability to move information and not people.

THE NEED TO UPDATE *THE 1988-2000 LONG-RANGE PLAN FOR TECHNOLOGY OF THE TEXAS STATE BOARD OF EDUCATION*

EXECUTIVE SUMMARY

In accordance with legislation passed in 1985, the State Board of Education developed and adopted the *1988-2000 Long-Range Plan for Technology*. Although visionary for its time, it has become outdated in the face of a number of factors. These factors include:

- Legislation at the state and federal levels
- Developments in technology
- Increased expectations by business and industry
- Changes in the public education system
- Changes in higher education
- Community needs

Legislation. The 74th Texas Legislature passed three bills that affect state planning for educational uses of technology. Senate Bill 1 directed the State Board of Education to develop a plan for schools to acquire and use technology. House Bill 2128 established the Telecommunications Infrastructure Fund Board to establish an infrastructure among public education, higher education, libraries, and medical facilities. Finally, House Bill 85 directed the Texas Higher Education Coordinating Board to develop a master plan for distance learning.

At the federal level, Goals 2000: Educate America Act calls for participating states to improve student achievement through technology. And, the Telecommunications Act of 1996 supports schools' access to the national information infrastructure.

Developments in Technology. The major development, barely foreseen in the 1988 plan, is the growth of the Internet. Connectivity to

the Internet affords educators, students, and community members a wealth of opportunities that must be reflected in the board's long-range plan for technology since connectivity affects not only technology but also the process of education. The plan also addresses advancements in multimedia technologies.

Business and Industry. Business and industry expect entry-level workers to have sophisticated technology skills. Public education and the private sector need to work together to identify and foster these skills.

Public Education. Considerable changes have taken place in the past eight years in the public education system. Among these are a significant shift toward local flexibility and a diminished state role; revision of the state curriculum, including expectations for students' proficiencies with technology; the development of the Commissioner's Plan for Information Access, which would increase educators' access to statewide education data; and, a more diverse student population with greater learning needs.

Higher Education. The *Master Plan for Distance Learning* addresses enrollment of public school students in college courses by distance. In addition, pre-service teachers must be prepared to teach the technology skills that students need.

Community Needs. Community members as well as public schools can benefit from the educational resources available through a telecommunications infrastructure.

THE NEED TO UPDATE *THE 1988-2000 LONG-RANGE PLAN FOR TECHNOLOGY OF THE TEXAS STATE BOARD OF EDUCATION*

In House Bill 1304, the 69th Texas Legislature required the State Board of Education to develop a long-range plan for technology. The resulting document, *1988-2000: Long-Range Plan for Technology*, was adopted by the board in 1988. It plotted the course for meeting educational needs through technology and for implementing the concomitant 1988-2000 changes in education.

Although the plan's accomplishments, summarized in the Appendix, are considerable, a number of factors compel a reexamination of its goals and recommendations. These factors include changes in:

- State Legislation
- Federal Legislation
- Developments in Technology
- Business and Industry Expectations
- Climate of Texas Schools
- Higher Education
- Community Needs
- Lessons Learned Since 1988

State Legislation

In 1995, the 74th Texas Legislature enacted three laws that affected the original long-range plan for technology.

Senate Bill 1

Senate Bill 1 states, "The mission of the public education system of this state is to ensure that all Texas children have access to a quality education that enables them to achieve their potential and fully participate now and in the future in the social, economic, and educational opportunities of our state and nation. The mission is grounded on the conviction that a general diffusion of knowledge is essential for the welfare of this state and for the preservation of the liberties and rights of citizens."

In order to support the diffusion of knowledge, Senate Bill 1 established Section 32.001 of the Texas Education Code (TEC) which calls for the State Board of Education to develop a plan for:

- acquiring and using technology in the public school system;
- fostering professional development related to the use of technology;

- fostering computer literacy among public school students, so that by the year 2000 each high school graduate in the state has computer-related skills that meet standards adopted by the board;
- identifying and, through regional education service centers, distributing information on emerging technology; and
- accessibility to technology by students with disabilities.

The fundamental goal of this *Long-Range Plan for Technology, 1996-2010* is to enhance students' acquisition of knowledge through technology.

Impact on the Long-Range Plan for Technology, 1996-2010. Many of the objectives set forth in Section 32.001, of the Texas Education Code were addressed in the original long-range plan for technology. Some sections of the plan, however, such as those on professional development and accessibility, need strengthening.

House Bill 2128

House Bill 2128, Section 3.606, created the Telecommunications Infrastructure Fund. Deriving revenue through the Telecommunications Utilities Account and the Commercial Mobile Service Providers Account, the fund is intended to award \$150 million in grants and loans for each of the next 10 years to public schools, colleges, libraries, and telemedicine centers to:

- provide computer equipment, wiring, and infrastructure—that is, the tools, materials, training, and services— needed for distance learning* and information sharing;
- develop and deliver courses and materials by distance; and
- train teachers, faculty, librarians, or technicians.

Impact on the Long-Range Plan for Technology, 1996-2010. The expansion of the Internet and coordination of telecommunications planning among public education, higher education, libraries, and medicine are priorities of House Bill 2128 and need to be addressed in the updated long-range plan for technology.

House Bill 85

House Bill 85 directed the Texas Higher Education Coordinating Board to develop a distance learning master plan.

Impact on the Long-Range Plan for Technology, 1996-2010. As with House Bill 2128, House Bill 85 fosters closer coordination between public and higher education for distance delivery of courses, materials, and professional development.

*Distance Learning is that in which some materials and/or participants are not local.

Federal Legislation

Goals 2000: Educate America Act

Section 317 of Goals 2000 legislation, passed by the U.S. Congress in 1994, calls for state planning to improve student achievement by integrating technology into curriculum. The Goals 2000 Plan calls for a task force to describe:

- requirements for introducing state-of-the-art technologies into classrooms and school libraries;
- advanced technologies' enhancement of student learning;
- support for the national education goals;
- professional development;
- meeting the needs of low-income children through technology;
- use of existing telecommunications infrastructure;
- assessment;
- purchase of equipment by local education agencies;
- cooperation with the private sector and telecommunications entities; and
- promotion of adult literacy.

Impact on the Long-Range Plan for Technology, 1996-2010. This legislation led to Commissioner of Education Mike Moses to appoint of the Texas Task Force on Educational Technologies to reexamine the State Board of Education's original long-range plan for technology. The objectives of federal legislation address specific segments of the K-12 population and include communities and other entities in the scope of those who will be served by technology.

Telecommunications Act of 1996

In January 1996, the U.S. Congress passed telecommunications reform legislation. It included specific provisions to ensure affordable telecommunications access for America's schools and libraries to the national information infrastructure.

Impact on the Long-Range Plan for Technology, 1996-2010. The federal legislation emphasizes the importance of telecommunications for all schools and libraries and offers the telecommunications industries the opportunity to restructure and expand their services. The long-range plan for technology must attend to the national focus on universal connectivity while allowing flexibility to schools as the telecommunications landscape develops and evolves.

Developments in Technology

In the eight years since the adoption of the original long-range plan for technology, many technological advances have occurred. High-performance computers and communications equipment today are smaller, more powerful, and more capable of performing expanded tasks than was the case with 1988 technology. Examples include desktop computers capable of delivering multimedia services such as sound and moving images. Furthermore, equipment costs have decreased as various forms of technology have reached critical mass by entering the business and home markets.

If a keyword in the previous decade was “computers,” the keyword in the 1990s is “connectivity.”

With connectivity comes the opportunity for teachers to explore the Internet, expand distance learning, participate in professional development by distance, and transfer data electronically. Connectivity can allow learning to occur in different and nontraditional ways, expanding the number and types of learners. Other applications of new and emerging technologies — virtual reality and virtual relationships, knowledge webs, shared synthetic environments, and distributed learning and experiences — are illustrated in the “Vision of Technologies in Education, 2010,” section on page 1 of this document.

Impact on the Long-Range Plan for Technology, 1996-2010. While the 1988-2000 Long-Range Plan for Technology was visionary for its time, changes caused by the emergence of new technologies and cost-effective use of existing technologies create a need to examine their use in Texas schools. As projected in the original plan, instructional methods evolve as technology is infused into the educational environment. Thus, the new plan addresses both emerging technologies and the impact they have on pedagogy.

Business and Industry Expectations

Businesses of all sizes increasingly automate and computerize many functions. These include designing and manufacturing, analyzing sales and marketing information, sharing data over long distances among separate facilities, developing multimedia presentations, and using the Internet for a multitude of purposes, including advertising, promotions, and sales. To remain competitive and efficient in the world marketplace,

employers now demand sophisticated technology skills, even of entry-level employees.

Impact on the Long-Range Plan for Technology, 1996-2010. Young people must become experienced with the technologies used by business and industry. This plan must work with the private sector to articulate industry's expectations, to project future needs, and to encourage cooperation between public education and the private sector.

Climate of Texas Schools

Local Flexibility

With the passage of Senate Bill 1 in 1995, authority and accountability shifted to local authorities. The original long-range plan, written in a time of centralization, was prescriptive in nature. Therefore, an updated long-range plan is needed to provide leadership, allow flexibility, and be more closely aligned with local control. The plan can provide assistance to schools for local policy development and decision-making to best fit district needs.

Essential Knowledge and Skills

Senate Bill 1 also called for the development of Essential Knowledge and Skills to replace the Essential Elements adopted in 1984. This effort, begun in 1995 and projected to conclude with Board adoption in 1997, incorporates high expectations for students' use of computers, telecommunications, and other technologies. These expectations will not only allow students to access and analyze information, thus increasing learning power, but they will also foster the occupational skills called for by the private sector. This updated long-range plan for technology must support these expectations by providing both the infrastructure and the training that schools and educators need.

Commissioner's Plan for Information Access

The state's Public Education Information Management System (PEIMS), begun in 1988, has established a comprehensive database of information about public education. Access, however, is still highly limited.

The Commissioner's Plan for Information Access will capitalize on the success of PEIMS by bringing easy-to-use information to the classroom teacher. It will provide decision support systems to school administrators, school boards, and other policymakers. The updated technology plan encompasses the plan for information access.

Student Population

The face of education in Texas has changed since 1988. The Texas student population is growing rapidly, from 3.2 million in the 1989-90 school year to 3.67 million in 1994-95. Current projections place the number of Texas students at more than 4.1 million by the year 2001.

As it grows, Texas' student population is becoming more diverse. In the 1990-91 school year, racial and ethnic minority children became the majority student population in Texas. By 1994-95, they accounted for almost 53 percent of students. Hispanics are the fastest-growing student group, accounting for 70 percent of the annual enrollment growth. Enrollment in bilingual programs is expected to increase by 50 percent by the 2000-01 school year.

In terms of annual growth by grade, the greatest increase in student enrollment has occurred in pre-kindergarten, which serves limited-English proficient and low-income students. More than 46.3 percent of the state's students are economically disadvantaged.

Impact on the Long-Range Plan for Technology, 1996-2010. The updated long-range plan for technology must reflect these multiple developments. The plan recommends flexible paths for school policymakers and personnel to consider but does not presume a consistent pattern of development and use across the state.

Because of the comprehensive revision of the curriculum and the concerted effort to incorporate technology applications and skills, the original long-range plan for technology provides for the infrastructure necessary to meet teachers' and students' curricular needs. A fundamental aspect of this revised plan is the expansion of this infrastructure beyond that which was understood in 1988 to that which is necessary through the first decade of the 21st century.

The plan also encourages coordination across all education programs for all learners, regardless of their ages, disabilities, or learning styles. Technology plays a particularly critical role in meeting the needs of students with disabilities. Technology use needs to be a part of a core curriculum for such students so that they, like all students, can be prepared to use appropriate applications in higher education and the workforce. In addition, assistive technologies can help students with disabilities acquire the intellectual, academic, problem-solving, and other skills that all children are expected to learn in school. Board-adopted instructional materials, including electronic ones, and information delivered by technology must be accessible for all students and teachers. In addition, teachers—both those of students with disabilities and those who

themselves have disabilities—must receive training in selecting and using appropriate technologies.

Above all, the board's technology plan for 1996-2010 must ensure equitable access by all students to both the technology infrastructure and to the learning resources that it provides. A critical element of the original plan was the role that technology, equitably distributed, can play in addressing economic and other disparities among students. This goal is no less critical in the plan for 1996-2010.

Higher Education

Institutions of higher education in the state prepare more than 85 percent of the teachers in Texas classrooms. The ability of new teachers to incorporate technology use appropriately into instruction depends in large part on the training they receive in their pre-service education. The Texas Higher Education Coordinating Board's *Master Plan for Distance Learning* addresses the sharing of library resources, distance enrollment of high school students in college courses, and integration of technology into teaching and learning.

Impact on the Long-Range Plan for Technology, 1996-2010. Students graduating from Texas high schools must be prepared with the technology skills they will need in colleges and universities. Also, because pre-service teachers need to be prepared to use technology when they enter the classroom, recommendations are made in the updated plan regarding teacher preparation. The plan also recommends ongoing coordination by all institutions and levels of education to ensure the sharing of resources and expertise and the efficient and effective use of telecommunications.

Community Needs

Parents of school-age children are encouraged to become involved in their children's education. Telecommunications technologies offer multiple ways for this involvement to occur. Examples range from teachers electronically sharing homework assignments with parents to parents viewing classroom activities from a distance or electronically receiving parent education programs.

Other adults might also benefit from educational programs that are enhanced or delivered by technology. Literacy programs are an example. According to the Texas Adult Literacy Survey conducted in 1992, as many 28 percent of adults in the state (approximately 3.5 million people)

function at the lowest level of literacy, able to accurately perform only limited daily tasks.

Impact on the Long-Range Plan for Technology, 1996-2010. School- or community-based technology programs can deliver adult education, provide professional development, and accelerate adult learning. Cooperative planning between schools and their communities can inform parents of their children's educational progress, involve parents in their own educational programs, and expand the efficiency and use of school- or community-based technology centers.

Lessons Learned Since 1988

Perhaps the strongest needs compelling revision of the *1988-2000 Long-Range Plan for Technology* are the lessons learned since its inception. According to research conducted in 1996 by the Texas Center for Educational Technology to inform the development of the revised plan, school districts report that the following factors are critical:

1. collaborative planning
2. technology integration
3. financial support
4. combination of funds, knowledgeable people, and a thoughtful plan
5. comfort with technology
6. continual support
7. slow pace
8. teacher commitment
9. revised personnel units
10. professional development

Impact on the Long-Range Plan for Technology, 1996-2010. The following plan incorporates these lessons.